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EDGAR P. COPELAND, M.D.

Dr. Edgar P. Copeland was born in the District of Columbia "too many years ago." He was educated in the public schools and graduated from the Medical Department of Columbian University, now George Washington University, in 1900 when he was 21 years of age. He served as an undergraduate intern in the University Hospital the year it opened.

Dr. Copeland arrived at the Children's Hospital as Resident Student at the end of his third year in medical school. At that time the Resident Staff of the hospital consisted of a Resident Physician, a Resident Student and a Pharmacist who was required to be a student of medicine. It was the practise at that time that the incoming Resident Student was selected after competitive examination and advanced to the position of Resident Physician upon graduation. In those days the Attending Staff was made up of two physicians, Drs. George N. Acker and Samuel S. Adams, an Attending Surgeon, Dr. J. Ford Thompson, an Eye Surgeon, Dr. Swan M. Burnett, a pioneer ophthalmologist, and a little later a Nose and Throat Surgeon, Dr. Charles W. Richardson.

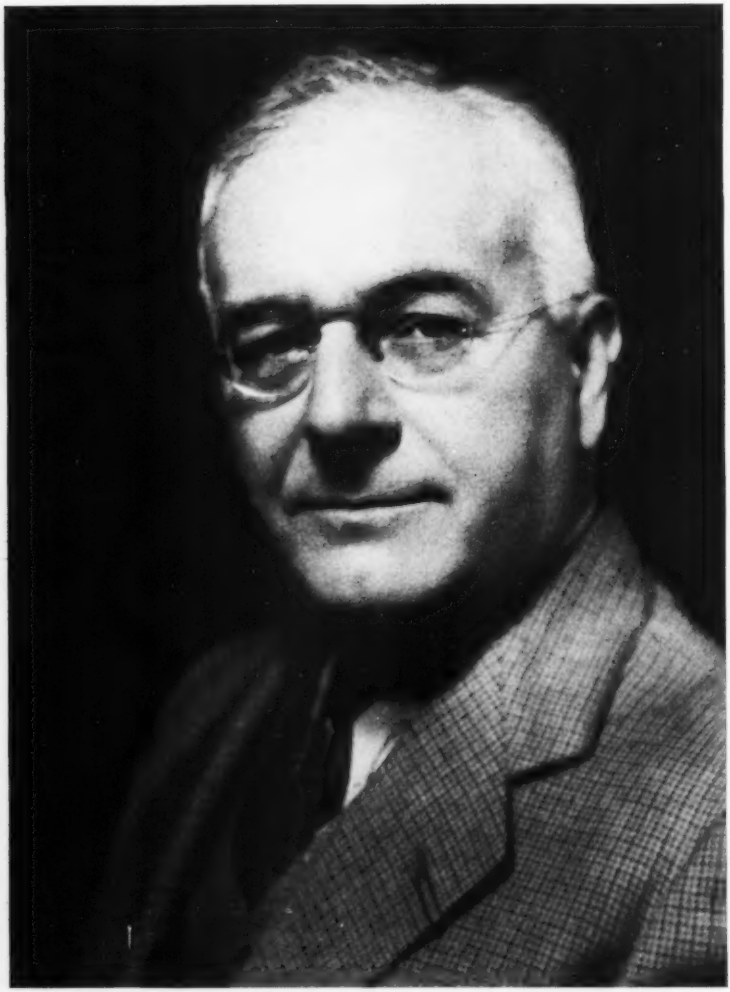
After completing his residency, Dr. Copeland spent a year in Europe where he enrolled in the Metropolitan School of Medicine in London and worked at the Brompton Hospital for tuberculosis and diseases of the chest and the Great Ormond Street Children's Hospital. Here he came under the influence of Sir Thomas Barlow who first described infantile scurvy as an entity ("Barlow's Disease"), and Lord Lister. He remembers keenly Robert Koch when he attended lectures at the Institute of Pathology in Berlin.

On his return to this country, he studied under Dr. John Lovett Morse at the "old" Children's Hospital in Boston and later in New York with Chapin and Pisak, Holt the Elder and August Caille.

Dr. Copeland was Clinical Professor of Pediatrics at George Washington University until 1924 and served a time as secretary of the Association of American Teachers of Diseases of Children enjoying a delightful acquaintance and, in many instances, a close association with many of the distinguished Pediatricians of America especially of the mid-west and west. A result of the contacts in this Association was his election to the Central States Pediatric Society which was probably a forerunner of the American Academy of Pediatrics.

The idea of the Academy was first broached at the home of Dr. Rosenfeld in Portland, Oregon in 1929 at the meeting of the American Medical Association. A small group merely discussed the prospect and Dr. Palmer Lucas of San Francisco, formerly an old friend in Boston, was instructed to formulate some plans. He in turn left the responsibility with Clifford

Grulee who was not present, and the organization began to take form. As the result of Grulee's dynamic personality the organizational meeting of



EDGAR P. COPELAND, M.D.

the academy was held in a "dinky" hotel during the meeting of the A.M.A. in Detroit in June 1930. Dr. Isaac Abt was elected its first president.

One thing that will always be fresh in Edgar Copeland's memory is the fact that he was a member of a committee of three, of which Henry Helmholz was chairman, appointed to propose a name for the new organization. He well remembers how difficult it was to find an English dictionary from which they hoped to pass upon the relative merits of "college", "academy", etc., finally proposing "academy" that was accepted by the meeting.

The first real meeting of the Academy came the following year at the Hotel Ambassador in Atlantic City immediately after the A.M.A. convention in Philadelphia.

Soon thereafter, in 1934, there was set up the American Board of Pediatrics, with representatives from the Academy, the American Pediatric Society and the Pediatric Section of the A.M.A. When this new yardstick for measuring professional qualification became established, the Academy adopted its certification as a necessary qualification for Fellowship.

"In the years that have elapsed since a few of us elected to limit our activities to the practice of Pediatrics, Washington has really became a pediatric center, eloquently attested to by the fact of 76 applications for 7 vacancies in the hospital staff as of July 1st. The opportunities presented by growth of our hospital and the splendid, many times brilliant, work of our younger men have been largely responsible for this progress."

Dr. Copeland served with the United States Navy as a Lieutenant Commander in the first World War and saw 14 months of active duty with that branch of the service. Locally he has served in so many capacities in the District of Columbia Medical Society, in local organizations dedicated to the service of children and on many committees of the American Academy of Pediatrics that space forbids listing. Of his local activities, he is most proud, however, of his efforts in drawing up the present Medical Practice Act of the District of Columbia. This policy, which was vigorously pushed through Congress by his and Dr. Joseph Wall's efforts, has served as a model for many states.

With great respect and affection the residents and younger staff members watch Edgar Copeland as he continues in private practice and takes such a vigorous lead in the many senior staff activities of our everyday hospital life. It is said that if his left shoulder droops a little from carrying his bag so many years it has only served to sharpen his eye, wit and sageness of his remarks as an elder statesman.

It is with keen appreciation for his many cooperative efforts and example that the Editors of the Clinical Proceedings of the Children's Hospital dedicate this issue of the magazine to Dr. Edgar P. Copeland.

LYMPHOSARCOMA

Case Report No. 131

Vincent McAuliffe, M.D. J. S. 48–3149

J. S., a 12 year old white male, was first admitted to this hospital on March 19, 1948 with a chief complaint of vomiting, constipation and bloody stools. The history revealed that the patient had been ill since November 1947 at which time he first complained of a generalized, dull, aching abdominal pain and tenderness in both lower abdominal quadrants. A generalized lymphadenopathy was present at that time and early in 1948 the patient was given a workup for possible blood dyscrasia and a lymph node biopsy was performed. All studies were reported as negative. The abdominal pain persisted and in February of this year, he first complained of pain in his joints. On March 15, he had an episode of vomiting and retching and the constipation which had been present for about two months became more resistant to laxatives. The vomiting was intermittent in character for 3 to 4 days and on March 19, the day of admission, he passed bright red blood from his rectum.

The past history and family history were negative. Physical examination revealed a well developed, well nourished white male of 12 years lying quietly in bed in no acute distress. There was a soft grade I apical systolic murmur heard loudest at the third left intercostal space. There was slight generalized abdominal tenderness most marked in the paraumbilical area. Just proximal to the symphysis pubis there was a hard, fixed mass measuring approximately 3 × 3 cm. Dr. Kiernan was called in consultation and he will discuss the findings in regard to the rectal and proctoscopic examination. The laboratory work on admission revealed a hemoglobin of 11 gms., with 3,300,000 red blood cells and 6,400 white blood cells with a normal differential. The urine was negative. Examination of the colon by means of a barium enema revealed a spasticity and irritability of the sigmoid. The barium, however, passed through it and filled the colon until it reached the cecum and caput coli where there was a definite smooth deformity and narrowing. This was believed to be due to an extrinsic mass pressure. The ileocecal valve was patent and revealed no evidence of abnormality. After evacuation the deformity in the cecum remained as previously described. Conclusions: "This points towards a markedly irritable sigmoid and a smooth deformity in the cecum most likely by an extrinsic mass. An intravenous pyelogram was negative. The benzidrine test for occult blood was positive. Sedimentation rate was 9 mm/hr. A laparotomy was performed by Dr. Kiernan on March 26, 1948

and the patient was discharged on March 31, 1948. Dr. Kiernan will discuss the operative findings.

The first two weeks following discharge he seemed somewhat improved. On April 14 a course of x-ray was started and during the succeeding twenty-five days he received twenty-two treatments for a total of approximately 1000 roentgen units anterior and 1000 roentgen units posterior over the abdomen. Early in May he began to complain of pains in his hands and his legs which soon became so intense that he could no longer walk and for the past three weeks he has been at absolute bed rest. During this period he has been running a fever of 102–104°F and on occasion complained of abdominal pain.

The second admission was on March 24, 1948 at which time he appeared chronically ill and complained of abdominal pain and pains in his arms and legs. The abdomen was moderately distended and the liver was palpable 2 finger breadths below the right costal margin. There was a hard, fixed mass 4 × 3 cm. in the right lower quadrant just proximal to the inguinal ligament which was now tender. The feet and ankles revealed a 2 plus pitting edema and the patient seemed to suffer severe pain when the lower extremities were handled. The cervical, axillary and inguinal glands were pea-sized, discrete and non-tender. The laboratory work at this admission is as follows: Febrile agglutinations negative; total protein 5.78 gms. per cent with an A/G ratio of 1.3/1; hemoglobin 11 gms., red blood cells 3,500,000, white blood cells 7,200 with 87 per cent neutrophiles, 11 per cent lymphocytes and 2 per cent monocytes. Urine was negative. X-rays of the skull and long bones were negative. His medication during this admission consisted of duracillin 300,000 units two times a day, morphine sulfate gr. 1/8 every 4 hours for pain and three blood transfusions. He was discharged on May 30, 1948 and expired at home on June 20, 1948.

DISCUSSION

Paul C. Kiernan, M.D.: I first saw Dr. Webb's patient in surgical consultation after his admission to the hospital.

In addition to the history previously given, the complaint of crampy abdominal pain accompanied by abdominal distention, vomiting, and obstipation was interpreted by us as significant of partial intestinal obstruction. In addition to the physical findings described, an extra-rectal, firm, fixed mass was palpable by digital rectal examination. Proctoscopic examination revealed no intrinsic lesion for the distance of 24 cm. scoped. Bloody mucus was noted coming from above and a colon ray was advised.

Our preoperative impression was an abdominal pelvic mass with partial small bowel obstruction, probably malignant.

The parents of the patient were forewarned regarding the probability that the lesion was not resectable and on March 26, 1948, he was explored. Through a right rectus muscle-splitting incision the abdomen was opened. There was a small amount of clear fluid present with multiple fixed nodules involving the peritoneal surface of the anterior abdominal wall, the mesentery of the terminal ileum and cecum and in the pelvis. These had the gross appearance of lymphosarcoma which was obviously generalized and inoperable. Therefore, a node was removed for biopsy and the wound closed without further exploration. The patient's convalescence was uneventful and he was dismissed from the hospital on the tenth post-operative day.

Because of the presence of partial small bowel obstruction in this case and therefore the possibility that the lesion originated in the small bowel, I thought it would be of interest to discuss lymphoblastoma of the gastrointestinal tract. I had occasion to operate on a similar case recently and will briefly describe such.

A child, seven years of age, was first seen when he complained of intermittent cramping abdominal pain. Physical examination and laboratory tests were negative. At surgical consultation it was decided that no emergency existed and further examinations, particularly x-ray study of the bowel, were requested. However, because shortly thereafter the diagnosis of acute intussusception of the small bowel was made, surgical exploration was carried out. A tumor of the ileum 3 by $2\frac{1}{2}$ cm. was found to be present and was the cause of the intussusception. The lesion containing bowel was resected with its mesentery. Microscopic diagnosis was lymphoblastoma, small round cell type. The adjacent nodes were enlarged but were not involved. Recovery from the operation was uneventful and after receiving roentgen therapy to the abdomen the patient was dismissed. In three months he returned complaining of abdominal pain and dyspnea. Roentgenologic examination revealed extensive abdominal and mediastinal metastatic lesions with fluid in both pleural spaces. The presence of this tumor was recognized early. The growth was reasonably small, localized, resectable and without apparent extension.

This unfortunately is the usual story with such lesions. Determination of the prognosis at the time of operation is difficult because there are no definite criteria. Although frequently seen as only part of a generalized process, lymphoblastoma can exist as a localized pathologic lesion.

Lymphoblastoma of the esophagus is rare because this portion of the alimentary canal contains no large lymph follicles. About one lymphosarcoma is found present for every 100 adenocarcinomas of the stomach resected for malignant lesions. About 20 per cent of the cases of malignant lesions of the small bowel are found to be lymphosarcoma. Of the 21

cases of lymphosarcoma of the large intestine exclusive of the rectum seen at the Mayo Clinic, 18 involved the cecum primarily. Only 10 cases primarily involving the rectum were noted.

Prognosis in general is better than for carcinoma but varies considerably with the location. According to Dockerty the outlook of rectal lesions is bad. Cecal lymphoblastoma can be cured in more than 50 per cent of cases probably because wide resection is possible in 90 per cent of cases. The prognosis for lesions in other locations according to him lies between the two extremes and involvement of lymph nodes is the deciding factor in prognosis even more impressibly than in carcinoma. In general, malignant lesions of the intestinal tract in the young carry a poor prognosis and furthermore, lymphoblastoma of the bowel which may at first seem to be localized usually quickly gives evidence of being a generalized disease. When lymphoblastoma is found in the stomach it is often possible to remove what at first appears to be an inoperable lesion and because of the usual good response to roentgen therapy long term survivals are not infrequent. Lesions of the cecum and ascending colon although frequently locally extensive often can be removed and the patient survives for many years.

Removal of specimens for biopsy in extensive lesions of the stomach, small bowel or colon is important. If the pathologist reports the finding of lymphoblastoma, resection combined with roentgen therapy may be possible and good results may be obtained in some cases.

PATHOLOGICAL DISCUSSION

E. Clarence Rice, M.D.: Microscopic examination of the abdominal tumor showed it to be a lymph node which has undergone a malignant change. The normal architecture has been destroyed and with the exception of a narrow rim of lymphocytes about the capsule, cells which are considerably larger than the normal lymphocytes have been layed down in rather large sheets or masses with some less dense areas containing a few lymphocytes in a loose stroma. The tumor cells stain much lighter than the normal lymphocyte and they have a rather vesicular type of nucleus with small nucleoli. Occasional mitotic figures are observed. Due to unsatisfactory fixation of the tissue, I have had considerable difficulty in making a definite diagnosis; however, I feel that we are dealing with a lymphosarcoma.

Lymphosarcoma and lymphoblastoma represent a group of the commonest malignant tumors seen in patients 12 years of age or younger. Adenomyosarcoma (Wilm's tumor) and neuroblastoma are usually seen somewhat more frequently in children's hospitals. A certain proportion of lymphosarcomas are associated with lymphatic leukemia. Spread of

these tumors occurs more often by direct extension to the adjacent structures than are distant metastases seen. Involvement of the bones and lungs is not common. Commonest sites in children as noted at this hospital have been the lymph nodes, mediastinum and gastrointestinal tract.

The tumor responds initially to small doses of x-ray and also temporarily regresses when nitrogen mustard is given. Thus far the duration of life in children with lymphosarcoma and lymphoblastoma is short. We have never seen a child of 12 years or younger survive as long as a year.

UNDIAGNOSED ESOPHAGEAL FOREIGN BODIES WITH REPORT OF A CASE

Case Report No. 132

John C. Sherburne, M.D.
Robert O. Warthen, M.D.

D. E. 45–6942

D. E., a 2½ year old colored male, was admitted to the Children's Hospital on November 19, 1947 because of a cough, fever and head cold of 24 hours duration. He had been well until 24 hours prior to admission when he developed a severe non-productive cough, grunting respirations, a sore throat and hoarseness. A low grade fever and mild mid-abdominal pain accompanied this illness as did a state of listlessness, anorexia and apathy. Symptomatic therapy and steam inhalations resulted in little improvement and the child was brought to the hospital. There had been no vomiting, diarrhea or constipation. He had always been a "high strung" child with frequent temper tantrums.

He was born at a local hospital after an uncomplicated full term pregnancy, being delivered spontaneously without ensuing neonatal complications. His birth weight was 9 pounds 14 ounces. Diet since birth had been more than adequate and his physical and mental growth and development met accepted normal standards. He had been immunized against diphtheria, whooping cough and small pox at the age of 6 months. There had been no childhood infectious diseases, operations or injuries and, with the exception of an occasional cold, he had been perfectly well until 17 months prior to admission. During 14 of those 17 months he was seen frequently in our outpatient department for upper respiratory infections and bronchitis. His first visit was 14 months prior to admission when his mother complained that he had had noisy respirations during the preceding 3 months. He had been treated by his local physician without improvement. Examination in the dispensary revealed an upper respiratory infection and a mild bronchitis as evidenced by numerous coarse râles throughout both lung fields. After 7 days of symtomatic therapy and 4 days of sulfadiazine the child responded and was discharged as cured, only to return two months later with a 3 day history of rapid wheezing respirations, restlessness, an inspiratory harshness when crying, mucous in his throat and an upper respiratory infection. Auscultation of his chest disclosed only harsh breath sounds over the trachea and bronchi. After a course of sulfadiazine and steam therapy the tracheobronchitis cleared. One month later he was again seen for an upper respiratory infection and a croupy cough of 24 hours duration. Examination of the chest

revealed roughened breath sounds throughout. A diagnosis of tracheobronchitis and laryngitis was made and he responded promptly to the same treatment that had been given previously. He was seen again 5 months prior to admission because of a cold, croupy cough and inspiratory wheezes of one week's duration. Examination of the lungs disclosed coarse

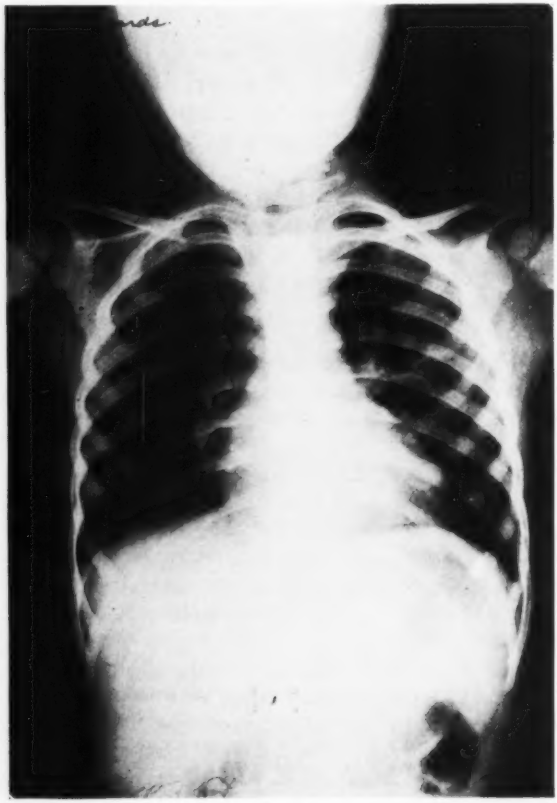


FIG. 1

inspiratory and expiratory rhonchi bilaterally and numerous musical râles, again diagnosed as tracheobronchitis. The usual routine was prescribed with satisfactory results. Fever was not a prominent sign during any of these episodes.

His father and mother were living and well as were 3 brothers. Family history was essentially negative.

Physical examination on admission revealed a well developed, well nourished 2½ year old colored male with moderate respiratory distress and a hoarse dry barking cough. The weight was 27 pounds, temperature 103.6°, pulse 120/minute and respirations 24 per minute. Both ear drums were dull with mild peripheral injection. The tonsils were enlarged,

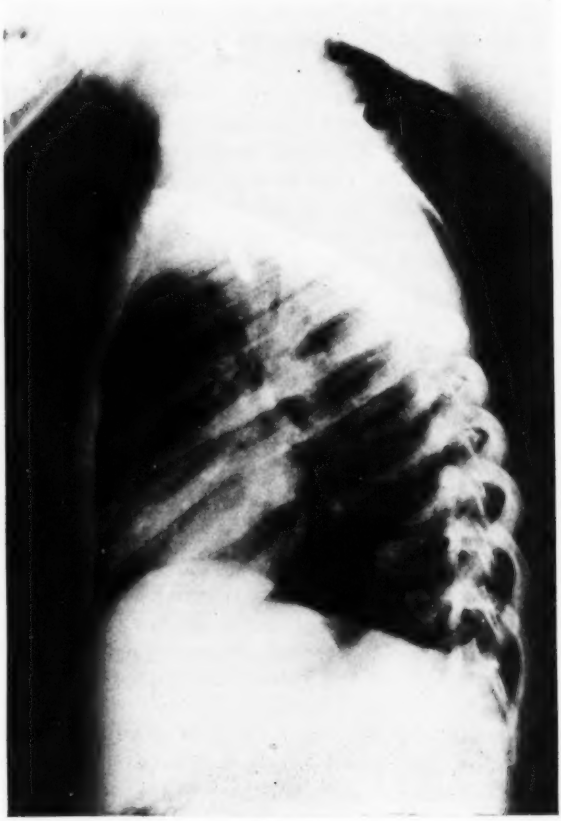


FIG. 2

cryptic and inflamed and there was a nasopharyngitis. Auscultation of the lungs disclosed numerous rhonchi throughout with a few scattered sibilant râles. The cervical and inguinal lymph nodes were moderately enlarged. The remainder of the physical examination was essentially negative.

An x-ray of the chest obtained 18 hours after admission revealed an opaque shadow 2 centimeters in diameter in the region of the 1st, 2nd and 3rd thoracic vertebrae, probably representing a metallic object (See Figs. I & II). Because this object was disposed transversely it was considered to be in the esophagus as objects usually occupy the AP diameter if in the trachea. There was no evidence of parenchymal pathology. On the following day the patient was esophagoscoped, and while no foreign body was located, the upper third of the esophagus was found to be markedly inflamed and edematous. While searching for the foreign body, the child ceased breathing, but receovery promptly after the institution of artificial respiration. An x-ray of the chest taken after this procedure in the lateral position disclosed the previously described foreign body (presumably a coin) to be in the esophagus in the region of the 2nd and 3rd thoracic vertebrae. Again on the 5th hospital day the child was esophagoscoped and tracheoscoped, the esophagus being visualized to the cardia of the stomach and the trachea as far as its bifurcation, and again no foreign body was located. Repeat antero-posterior and lateral chest x-rays showed no change from the previous films, the foreign body still occupying the previously described position.

Again on the 9th day the patient was esophagoscoped, and this time a penny was found deeply embedded in the anterior wall of the esophagus in the region of the tracheal bifurcation. This object was removed with little difficulty and the postoperative course was uneventful.

Treatment during the hospital stay consisted of penicillin, oxygen, steam, clyses and other symptomatic measures.

The temperature ranged from 98.6° to 101.4° for the first 3 days (with the exception of an admission temperature of 103.6°) and was within normal limits for the remainder of the hospital stay except for a fever of 101.4° on the day of the removal of the foreign body from the esophagus. The pulse ranged from 100 to 130 per minute and the respirations from 18 to 35 per minute. Routine Schick and Old Tuberculin intradermal tests were negative.

On the 19th hospital day an x-ray of the chest revealed an absence of the previously described foreign body and a minimal increase in fibrosis throughout both lung fields. No other evidence of pathological change was noted. The patient was discharged much improved on the 22nd day and a follow-up one month later revealed a normal healthy child.

DISCUSSION

This case serves to illustrate the importance of obtaining roentgenograms of the chest in cases of recurrent respiratory infections. Had the single procedure of x-raying the chest been performed at the onset of the pa-

tient's respiratory difficulties, the danger of the many complications of lodged foreign bodies in the esophagus would have been eliminated.

In general, foreign bodies in the esophagus lend themselves readily to diagnosis, but the rarer cases in which the presence of the foreign body is not known or suspected are difficult diagnostic problems and are very frequently complicated by severe pathological changes. With such cases in mind, this paper was written, for early diagnosis and cognizance of the complications are important in determining the prognosis and treatment of such cases.

Fortunately many of the common objects such as coins, buttons and other smooth objects which are swallowed without the knowledge of the parent will pass with ease through the gastrointestinal tract producing no signs or symptoms and causing no undue hardship. This probably happens more commonly than is generally realized and because of its frequency an occasional object will lodge in the esophagus, becoming a potential hazard.

Foreign bodies which have been embedded in the esophagus for a considerable period of time usually produce difficulties related to either the gastrointestinal or respiratory system. The case here presented is one in which a coin was apparently embedded in the esophagus for approximately 17 months, but fortunately produced no permanent damage such as might have been expected. Although the patient experienced frequent attacks referrable to the respiratory system, the diagnosis was not even suspected until an x-ray of the chest was performed at the time of his hospitalization. The symptoms produced by a foreign body usually depend on the size, shape and character of that object, though many objects of large size or extreme roughness may remain silent. Frequent symptoms are vomiting, salivation, choking, fever, melena, hematemesis, foul breath, pain on swallowing, the feeling of a lump in the throat or neck, cough, dyspnea, wheezing respirations, and sore throat. One or more of these symptoms may be present at a given time.

Sharp objects, such as fish bones and bone splinters, may produce sharp stabbing pains in the chest in the region of the heart which disappear only to be followed by fever and/or one or more of the symptoms listed. Several cases of this nature have been reported in which children have died of severe hemorrhage as a result of bone splinters perforating the wall of the aorta.

Cough, dyspnea and wheezing are usually associated with foreign bodies located in the cervical region of the esophagus because of pressure on the posterior tracheal wall and the nerves of that region. Cough may be due to reflex irritation or to partial esophageal obstruction with a resultant overflow of saliva or food into the larynx.

It must always be remembered that the esophagus is a very tolerant

organ and many cases, in which no history of ingestion has been elicited, will present symptoms later when ulceration has developed. The early quiescent period may be very dangerous since the foreign body may slowly pierce or erode the esophagus and surrounding structures. Though fever is not a frequent symptom it is one which usually appears later as a result of sepsis and should therefore serve to arouse the physician's suspicion. This is particularly true when meat bones are swallowed, for, due to their nature, they may erode deeply into the surrounding tissues with resultant ulceration and sepsis. Due to their penetrating abilities, such objects are often the offenders when cervical cellulitis and mediastinitis occur. Local or mediastinal hemorrhage may result from erosion. The complications discussed invariably lead to a fatal termination if the foreign body is not removed, or is discovered too late.

In regard to the diagnosis and treatment of esophageal foreign bodies, a word of warning must be mentioned concerning a procedure which only recently has been discontinued, that procedure being blind instrumentation. Previously probes were used blindly with some success, but because of the damage that ensued the method has been abandoned. Forcing a stomach tube, bougie or an old fashioned probe through an already injured esophagus can not be considered good surgery. It must also be remembered that prolonged esophagoscopy may be quite dangerous due to the trauma involved. The esophagoscope is one of the most important aids in the diagnosis of foreign bodies, especially when x-ray has failed to give a positive location. Needless to say, the esophagoscope is the most adequate means for removal of the foreign body. In all cases where possible an esophagoscope should be employed but only for short periods of time as the membranes may be ulcerated and hence are perforated easily.

With the use of the x-ray much comforting information may be given anxious parents. Coins and buttons have been located and bone splinters have been seen, yet x-ray alone may not be enough. Fluoroscopy from many angles and/or barium swallows may be of value in locating small and hidden fragments. Barium impregnated cotton may also be of value, for when swallowed, particles of the cotton may adhere to bones, splinters, or other foreign objects thus identifying the object and its location when the chest is x-rayed or fluoroscoped.

Of special interest is a case reported by Turner for it shows the complications that could have occurred in our case had the coin not been found. His patient was an 8 year old male who died of hemorrhage as the result of a coin fixed transversely in the esophagus for a period of 4 years. The esophagus was almost cartilaginous in consistency and at the bottom of the pocket in which the coin was embedded was a small aperture about the size of a pin from which the fatal hemorrhage occurred. The neighboring

portions of the esophagus, trachea and aorta were matted together by dense fibrous connective tissue.

It can be seen from the above discussion that a thorough history must be elicited and all phases of that history considered. X-rays, fluoroscopy, esophagoscopy and other diagnostic and therapeutic measures must be employed with great care and diligence so that the foreign body can be removed without complications.

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PYLORIC STENOSIS WITH RECURRENCE

Case Report No. 133

Claude A. Frazier, M.D. D. M. 47–10021

D. M., a one month old white male, entered Children's Hospital on September 28, 1947. Born of a full-term pregnancy, at which time he weighed 8 lbs., 9 oz., this infant was fed evaporated milk until the age of ten days. He then commenced to regurgitate part of his feedings, and the formula was changed to Similac. The vomiting became progressively more frequent and on admission he was retaining very little in spite of sedatives. The vomiting was not described as projectile in character.

Physical examination on admission revealed a rather large, well developed and mildly dehydrated white male infant, who was very restless and fretful, continually chewing his hand. His weight was 8 lbs. 6 oz. The pertinent physical findings were confined to the abdomen. An olive-size tumor was felt deep in the epigastrium 1½ cm. above and to the left of the umbilicus. Following a feeding, gastric peristaltic waves were observed, followed by projectile vomiting. A hemogram revealed a hemoglobin content of 18 gm. per cent, and a normal leucocyte count. Urinalysis was negative.

Following parenteral fluid replacement, the infant was operated upon on the fifth hospital day. Under drop ether anesthesia, through a right rectus incision, a classical Fredet-Rammstedt pyloroplasty was done for a typical pyloric stenosis. A transfusion of 100 cc. citrated blood was administered post-operatively. Similac feedings were resumed and were well tolerated, but he continued to vomit small amounts. His weight, when discharged on the twenty-seventh hospital day, was the same as on admission.

Approximately one month later this patient re-entered Children's Hospital, with a history of vomiting part of each feeding since his discharge from the hospital. The frequency and amount of vomiting had gradually increased and had become projectile several days prior to re-entry. Olac and whole lactic acid milk feedings had been used without benefit.

Physical examination revealed a marasmic, poorly nourished, dehydrated, three month old male infant, weighing 8 lbs. 9 oz. The temperature was 99 F. The anterior fontanelle was open and slightly depressed. The skin was dry and of poor turgor. The anterior cervical nodes were palpable. The abdomen was moderately distended with abnormal prominence of the superficial abdominal veins. On palpating his abdomen, a small, hard, round tumor was felt in the region of the pylorus.

On admission the infant was placed on a formula of Hypoallergin and

Alderdex thickened with cream of wheat and supplemented by elixir of phenobarbital. While on this regime, about one half of each feeding was retained. Daily administration of subcutaneous fluid and a transfusion of 100 cc. citrated blood, resulted in a weight gain to 9 lbs. 8 oz. by the 5th hospital day. The infant was given two plasma transfusions and on the seventeenth hospital day the abdomen was re-opened and a distinct pyloric tumor found; the circular muscle fibers were separated with difficulty because of scar tissue present from the previous operation. A pyloroplasty was done. Post-operatively, the Brennemann routine of oral feeding was instituted, using evaporated milk. On the first post-operative day, the infant developed signs of pneumonia of the left lower lobe. He was placed in an oxygen tent and penicillin therapy started. This complication was readily controlled and his temperature returned to normal on the 4th post-operative day.

Periodic vomiting of part of the formula recurred on the fifth post-operative day, which was associated with a slight weight loss. At this time cereal and pureed vegetables were added to his diet, as well as protein hydrolysate. The vomiting continued and his weight failed to increase. A dilute lactic acid formula was used unsuccessfully. Clinical suspicion of a subdural hematoma was ruled out by a subdural tap. On the 42nd hospital day Nutramigen feedings were commenced and supplemented by the use of tincture of belladonna and elixir of phenobarbital. On this regime the vomiting promptly ceased and dextri-maltose was gradually added. A weight gain of ten ounces occurred in the ensuing week. The daily caloric value of the Nutramigen formula was gradually increased to 820, with a continued rise in the infant's weight. He was discharged approximately three months post-operatively, at which time his weight was 11 lbs. 6 oz.

DISCUSSION

J. Ogle Warfield, Jr., M.D.: Schaefer and Erbes of the Milwaukee Children's Hospital recently reported 248 cases of hypertrophic pyloric stenosis, collected over a period of 23 years. Of these cases, the total mortality was 6.4%. Of the 232 cases operated, 3.8% resulted in mortality, as contrasted to 46.6% mortality in the 15 cases not operated. During the past ten years, 172 cases were operated without mortality, which was attributed to improved pre- and post-operative care.

Pyloric stenosis occurs much more frequently in males (85%) but, contrary to former teaching, the condition occurs with equal frequency in the artificially and breast fed baby. The condition is uncommon in the colored race, and 43% of the cases occur in the first-born of a family.

Biopsy of the pyloric tumor shows whorls and bundles of smooth muscle

and connective tissue fibers, resembling the picture of a uterine fibroid. The longitudinal and circular fibers cannot be differentiated. There is both intra- and extra-cellular edema. It would, therefore, seem unlikely that protein sensitization plays any part in the etiology.

Ladd[2] of Boston claims that the tumor may be palpated in 98% of cases, while Schaefer and Erbes of Milwaukee palpated the tumor in 63% of patients. When the cardinal symptoms and signs are present, including a palpable tumor, x-ray examination is not necessary. In patients in whom a palpable tumor is not present, the diagnosis may be confirmed by x-ray findings of pre-pyloric narrowing with a string sign. Taber and Davis[1] of Standford found by x-ray study that the stomach post-operatively required 8 to 24 hours to empty. In view of this, it would seem that post-operative feeding should be carried out slowly and gradually until the 5th or 7th day, at which time the baby is returned to a full feeding schedule.

Recurrence of pyloric stenosis is usually due to incomplete operative division of the pyloric fibers. I have never seen or heard of an instance of recurrence due to rapid healing of the split pyloric muscle, as was inferred to be the case in the patient here presented. The surgeon is always concerned about the possibility of perforation at the time of operation. The pyloric tumor gradually tapers off into the stomach wall, but ends abruptly at the duodenum where the chance of perforation is greatest. The mucosa is more intimately attached to the sub-mucosa in the duodenum than in the stomach, and is therefore more easily perforated. I would like to offer here two suggestions as to treatment:

1. An absorbable hemostatic sponge, such as "Gel-Foam," may be used to control bleeding which occasionally occurs and which is difficult to control with ligature. Such a sponge loosely placed between the cut ends of the pyloric muscle, so as not to cause pressure on the bulging mucosa and produce obstruction might present too rapid healing of the muscular incision and subsequent recurrence.

2. A measure which would insure that all constricting muscle fibers are completely divided would be the mounting of a large magnifying glass upon an adjustable stand, to be used during the operative procedure.

REFERENCES

1. Taber, H. K. and Davis, J. H.: Journal Amer. Med. Assoc., 1940, Vol. 114, p. 847.
2. Ladd, W. E., Ware, P. F., and Pickett, L. K.: Journal Amer. Med. Assoc., Vol. 131, p. 647.

CLINICO-PATHOLOGICAL CONFERENCE

Directed by: E. Clarence Rice, M.D.
Assisted by: Adrian Recinos, Jr., M.D.
Harold W. Bischoff, M.D.
By Invitation: George Maksim, M.D.

Adrian Recinos Jr., M.D.

Case # 1: A five day old white male was admitted to Children's Hospital with vomiting, dyspnea, and cyanosis since birth.

The infant was delivered at term at another hospital with the aid of mid forceps. He weighed five pounds twelve ounces at birth and breathed spontaneously. At the age of two hours he had an episode of labored breathing and cyanosis which responded to oxygen. All attempts at feeding were followed by immediate regurgitation, difficulty in breathing, and cyanosis. The infant appeared comfortable and breathed normally between feedings at first, but the dyspnea became constant in the third and fourth days of life. His temperature ranged from 102° to 105°F. He received parenteral fluids on several occasions. The stools were normal.

Examination on admission revealed an acutely ill, malnourished and dehydrated infant breathing with considerable difficulty. The respirations were principally diaphragmatic with slight retraction of the ribs. The chest was clear to percussion, but numerous rhonchi were heard over both lung fields.

A catheter could not be passed into the stomach, apparently being stopped in the upper esophagus. X-ray examination after instillation of lipiodol into the catheter revealed a radio-opaque pouch in the upper mediastinum. The lungs were not remarkable. There was considerable air in the gastrointestinal tract. The patient was operated on the day after admission.

Case # 2: A four day old white female was admitted to Children's Hospital with a history of persistent vomiting since birth. She was the product of a normal pregnancy and delivery and weighed 8 pounds.

Vomiting followed every feeding (breast), was forceful but no projectile, and was not bile stained. Several small stools were passed by rectum. Thickened feedings and phenobarbital were given for 24 hours without avail. On the third day of life a catheter was passed readily into the stomach and approximately 3 ounces of previously ingested milk was aspirated. There were no respiratory difficulties and no abdominal distension. The infant had remained alert and vigorous.

Physical examination on admission was negative except for a mild dehydration. No abdominal organs or masses were palpable.

X-ray examination of the chest was negative. Flat plate of the abdomen revealed an air bubble in the stomach and some air in the colon (perhaps due to an enema). There was no air in the small intestine. Ingested barium could not be projected beyond the first part of the duodenum as seen under the fluoroscope.

The infant was operated on the day of admission.

DISCUSSION

George Maksim, M.D.: The first case is typical of esophageal atresia with tracheoesophageal fistula. This congenital anomaly should always be thought of in cases of vomiting and respiratory difficulty shortly after birth, particularly when associated with feedings. The important thing is to think about it and pass a catheter early. This type of history can occur with such things as pulmonary atelectasis and intracranial hemorrhage. Recently I had a newborn who became cyanotic at the first feedings of sterile water. I strongly suspected an esophageal atresia and was surprised when a rubber catheter was passed easily into the stomach. The baby was later found to have atelectasis. Vomiting, dyspnea, and cyanosis are also seen in congenital diaphragmatic hernia. This diagnosis can be established by physical and x-ray examinations of the chest.

The diagnosis of esophageal atresia is made by the inability to pass a rubber catheter into the stomach. An innocuous radio-opaque substance such as lipiodol may be instilled through the catheter. The upper esophageal segment will be outlined, and if there is a tracheal fistula, (as there is in some cases of esophageal atresia) lipiodol may be seen in the stomach. In the case summarized here, the presence of air in the gastrointestinal tract by x-ray indicates that a tracheal fistula exists. Barium should never be used because of its foreign body reaction in the lungs.

The treatment of esophageal atresia is surgical. Operative repair should not be unduly delayed because the risk of waiting is often greater than the risk of surgery. The operation of choice at present is ligation of the tracheal fistula and direct anastomosis of the two ends of the esophagus. Good results and low mortality rates have been reported. This procedure has obvious advantages over that of exteriorizing the upper esophageal segment and constructing an esophagus externally along the anterior chest wall.

The second case is more of a diagnostic problem and suggests several possibilities. First, I would consider an atresia high in the bowel, probably in the duodenum. The type and persistence of vomiting and the x-ray studies support this diagnosis. An external band or tumor may constrict the duodenum and cause obstruction.

The presence or absence of peristaltic waves was not mentioned. This

is an important point because peristaltic waves are seen only above the level of obstruction, and thus can help locate the point of obstruction.

While it is highly improbable in this case, pyloric stenosis should not be overlooked at this early age. I should like to cite a case in which operation was delayed until the fifteenth or sixteenth hospital day because the baby had begun to vomit on the second day of life so it was decided pyloric stenosis was not likely. Finally, when the baby became cachectic, the pyloric tumor was easily felt and an operation was performed. It was too late, however, and the patient died after the operation.

Pylorospasm should always be considered in vomiting of the neonatal period. This usually occurs in the infants called "hypertonic" by Holt and "hyperkinetic" by Gesell. They are the "jittery" babies with exaggerated Moro reflexes and the "colicky" babies with so-called "3 months colic," "6 months colic," and so forth. The etiology of pylorospasm is unknown and the mechanism is obscure. Thickened feedings and phenobarbital in adequate doses often give relief.

Lastly, a birth injury with cerebral anoxemia, hemorrhage or edema is possible but the general appearance and condition of this baby would make this diagnosis only a remote likelihood.

My impression, then, is that the first patient had an esophageal atresia with tracheo-esophageal fistula and the second a high intestinal, probably duodenal, atresia.

PATHOLOGIC DISCUSSION

E. Clarence Rice, M.D.: Dr. Maksim's diagnoses are correct.

Case #1: The body was that of an undernourished white male infant weighing 2,640 grams, length of body 49 cm. A long postero-lateral incision was present over the right sixth rib, which had been resected. There was practically no subcutaneous fat. Examination of the thorax revealed an unsuccessful attempt to anastamose an esophageal atresia. The upper segment measured 4 cm. in length and 1.2 cm. in width. It had been opened surgically at its lower portion. Approximately 1.5 cm. below was found the upper end of the lower segment which had been opened similarly to the one above. Its diameter was one-third that of the upper. The trachea and bronchi contained no foreign material, however a 3 mm. tubular structure communicated with the posterior trachea at the bifurcation. This had been sutured and appeared to be representative of esophageal tissue. Both lungs were heavy and airless varying from a purplish-red to dark red in color. The bronchioles did not appear to contain any exudate. The gross appearance was that of atelectasis, but microscopic examination revealed both atelectasis and bronchopneumonia. The heart and abdominal viscera were essentially normal except for moder-